

## CLAIMS

1. A water-based, substrate treatment composition comprising (A) at least one chitosan selected from chitosan and a chitosan derivative and (B) a metal compound comprising  
5 at least one metal selected from Ti, Zr, Hf, Mo, W, Se, Ce, Fe, Cu, Zn, V and trivalent Cr.

2. A water-based, substrate treatment composition according to claim 1, which is useful for a metal material.

3. A water-based, substrate treatment composition  
10 according to claim 1, wherein said chitosan derivative is chitosan, carboxymethylchitosan, a cationized chitosan, a hydroxyalkylchitosan, and/or a salt thereof.

4. A water-based, substrate treatment composition according to claim 3, wherein said chitosan derivative is  
15 glycerylated chitosan and/or a salt thereof.

5. A water-based, substrate treatment composition according to claim 1, wherein said metal compound (B) is a metal compound comprising trivalent Cr, Ti, Zr, V, Mo or Ce.

6. A water-based, substrate treatment composition  
20 according to claim 1, further comprising (C) an organic compound comprising at least one carboxyl group in a molecule thereof.

7. A substrate treatment method, which comprises coating a material, which is to be treated, at a surface thereof  
25 with a water-based, substrate treatment composition according

to any one of claims 1-6, optionally rinsing said surface of said material with water subsequent to said coating, and heating and drying said material in a temperature range of from 80°C to 300°C.

5           8. A substrate treatment method according to claim 7, wherein said material to be treated is a metal material such as aluminum, magnesium, copper, iron, zinc, nickel, or an alloy thereof.

10           9. A substrate treatment method according to claim 7 or 8, wherein a dry coat weight of said chitosan (A) to said surface of said treated material is in a range of from 1 to 500 mg/m<sup>2</sup> calculated as chitosan, and a dry coat weight of said metal compound (B) to said surface of said treated material is in a range of from 1 to 500 mg/m<sup>2</sup> calculated as said metal.

15           10. A metal material treated by a substrate treatment method according to any one of claims 7-9.

11. A metal material according to claim 10, wherein said metal material is aluminum, magnesium, copper, iron, zinc, nickel, or an alloy thereof.